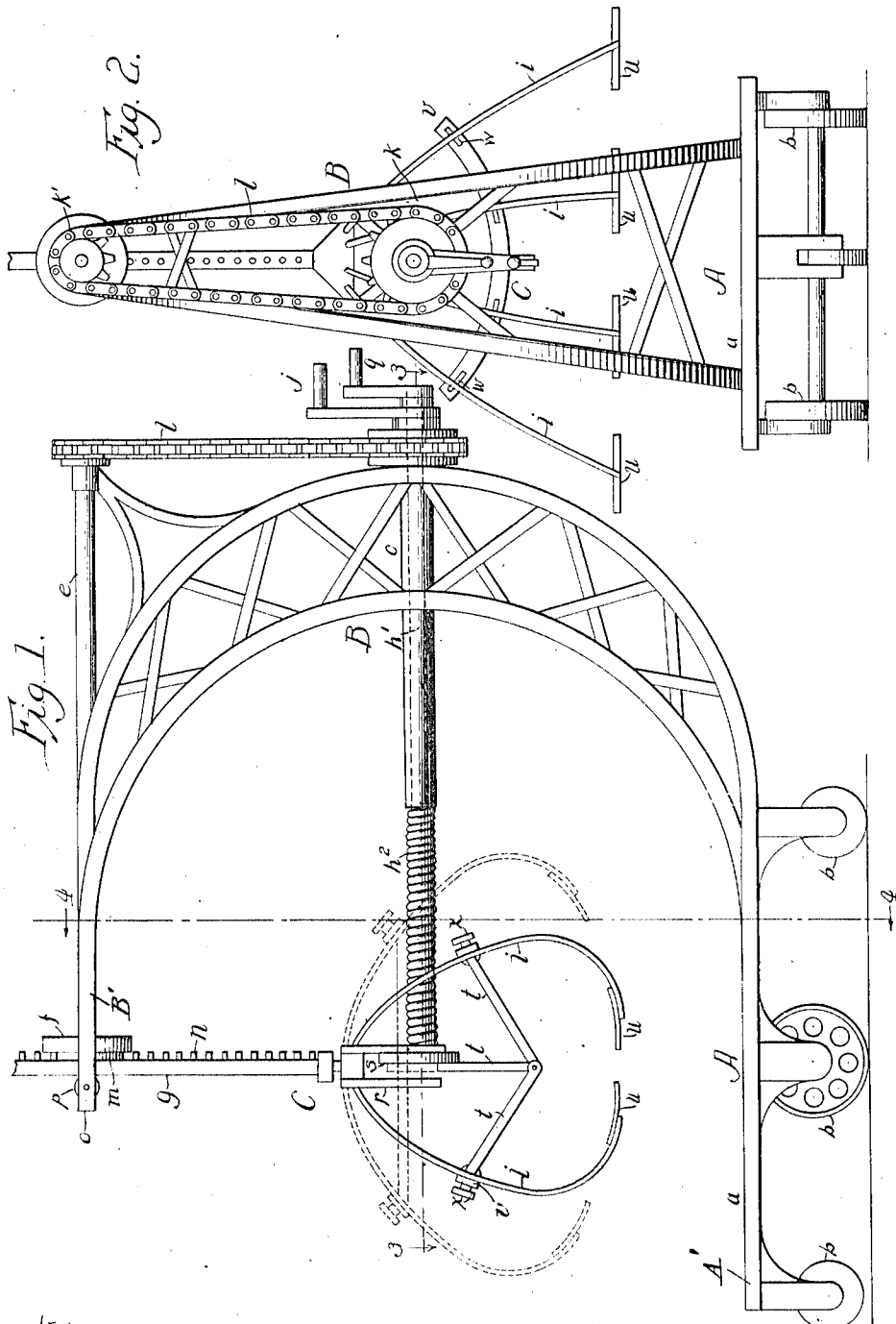


W. A. ALLEN.
INVALID LIFTER AND CARRIER.
APPLICATION FILED JUNE 10, 1912.

Patented May 13, 1913.

2 SHEETS—SHEET 1.

1,061,715.



Witnesses:
John McCanna
D. B. Coe

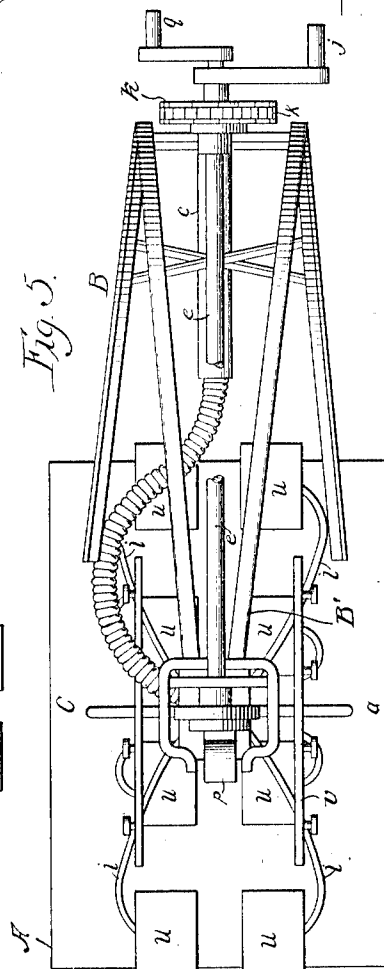
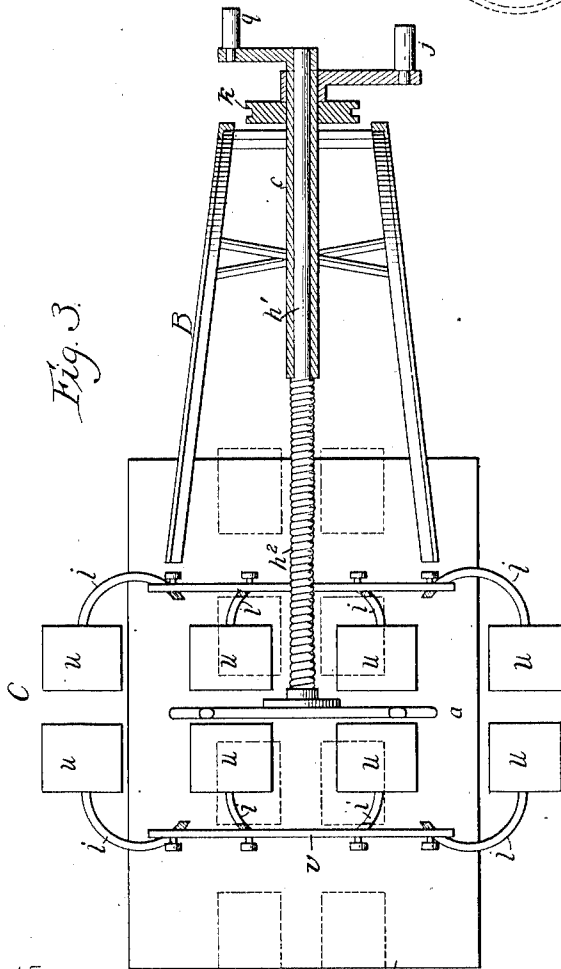
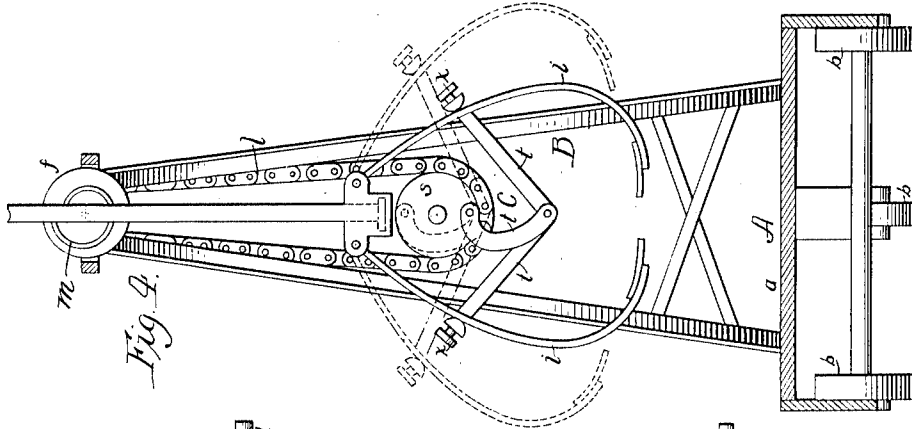
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Wilson A. Allen
By A. O. Reher
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Witnesses:
John McNamee
B. B. Cox

Inventor:
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UNITED STATES PATENT OFFICE,

WILSON A. ALLEN, OF ROCHESTER, MINNESOTA.

INVALID LIFTER AND CARRIER.

1,061,715.

Specification of Letters Patent.

Patented May 13, 1913.

Application filed June 10, 1912. Serial No. 702,977.

To all whom it may concern:

Be it known that I, WILSON A. ALLEN, a citizen of the United States, residing at Rochester, in the county of Olmsted and State of Minnesota, have invented certain new and useful Improvements in Invalid Lifters and Carriers, of which the following is a specification.

My invention relates to hospital equipment, and it consists of a device adapted to be used in lifting sick or wounded persons from their cots or beds, holding them in a comfortable position while their cots or beds are being re-arranged, changed or made up, gently conveying them from one room to another, or from one place to another, and to as gently replace them upon their cots or beds, as will hereinafter be more fully described.

It is a common practice (save and excepting in hospitals fully equipped with surgical appliances) to lift invalids, and to hold them in one's arms while their cots or beds are being re-arranged, changed or made up, but as such practice is unsanitary, often painful to the patient, and always wearisome to the nurses or attendants, it is the purpose of this my present invention, to provide safe and gentle means for handling invalids, whereby the dangers of contagion are minimized, the unnecessary suffering of the patient may be avoided and much of the weariness of the nurses or attendants may be unknown.

My invention is clearly illustrated in the accompanying drawings, fully described in the following paragraphs of this specification, and particularly referred to in the subjoined claims.

In the drawings referred to, Figure 1 is a side elevation of my lifter and carrier complete; Fig. 2 is a rear end view thereof; Fig. 3 is a horizontal longitudinal section of Fig. 1, taken on the line 3-3; Fig. 4 is a vertical cross section of Fig. 1, taken on the line 4-4, and Fig. 5 is a top view of my device.

Similar letters refer to similar parts throughout the several views.

The truck A, is not unlike trucks for similar purposes consisting as it does of a frame or platform *a* having wheels *b*, which wheels should be provided with rubber tires, to deaden the sound, and to give them elasticity. This truck A serves to support the crane B, and to provide means for its carriage from place to place as for instance

from the invalid's cot or bed to an operating table.

The crane B may be constructed of any suitable material, and in any desired form adapted to the purpose. As herein shown it consists of two transversely braced trussed segments, this form being adapted to give the minimum of strength with the minimum of weight, while its form is peculiarly adapted to the purpose for which it is designed, its upper overhanging portion B' being adapted to be brought directly over the invalids while upon their cots or beds (the forward portion A' of the truck A being adapted to be run under the cots or beds).

The lifting and suspending means C constitute the novel features on my invention. It embodies the crank shaft *c*, the sprocket gear *d*, the counter-shaft *e*, the spiral disk *f*, the toothed bar *g*, the flexible shaft *h*², and the grapples *i*. The crank shaft *c* is horizontally journaled in the crane B, being arranged longitudinally with the truck A. This shaft is longitudinally pierced thus adapting it to serve as a bearing for the flexible shaft *h*' and *h*² hereinafter described, and is located intermediate the upper and lower portions of the crane, thereby locating it at about the level of the shoulder of a person of average height. It is rotated by means of the hand crank *j*, and transmits motion to the counter-shaft *e* by means of the sprocket wheels *k* and *k*' and the sprocket chain *l*.

The counter-shaft *e* is horizontally journaled in the upper portion of the crane B being arranged longitudinally therewith, and parallel with the crank shaft *c*. It is rotated through the operation of the sprocket gear K', by means of the crank shaft *c*.

The spiral disk *f* is rigidly affixed to the front end of the counter shaft *e*, and is therefore rotated thereby. Its spiral thread *m* engages the teeth *n* of the toothed bar *g* which bar is raised or lowered thereby (according to the direction of rotation of the counter shaft *e*). This toothed bar (*g*) is slidably mounted in a guide *o* affixed in the forward portion B' of the crane B, and is relieved of a portion of the friction thereon by means of the friction roller *p*.

The flexible shaft *h*' is journaled within the longitudinally pierced crank shaft *c*, and is operated independently thereof, the latter serving only as a convenient bearing

therefor. The portion h' of this shaft (the portion lying within the crank shaft c) may be inflexible, while the portion h^2 thereof consists of a wire coil, thereby adapting it to the contortions necessary to its function.

To the rear portion of this flexible shaft, (the inflexible portion) is rigidly affixed a hand crank q by means of which it is rotated, and to its front portion thereof (the flexible portion) is rigidly affixed the swivel block r and pivotally affixed to the lower end of the toothed bar g and therefore revoluble thereupon. The lower end of this swivel block r is bifurcated for the outer flexible portion of the flexible shaft h' .

Rigidly affixed to the flexible shaft h' and lying within the bifurcated portion of the swivel block r is a disk or crank s to which disk is pivotally affixed toggle levers t , the purpose of which will hereinafter be set forth.

The grapplers i consist of a series of curved arms, preferably eight in number, which arms are arranged in four pairs, which are respectively provided at their lower ends with the thin broad plates u adapted to be passed underneath the invalid to be lifted. These arms (i) are pivotally affixed to the swivel block r and therefore adjustable thereon. Each and all of these arms are adjustably affixed intermediate their length to one of the two parallel bars v , by means of which each pair (the arms oppositely arranged) may be adjusted to the length of the person, one pair of arms being adapted to underlie the head of the patient, one pair the shoulders or upper portion of the trunk, one pair the lower portion of the trunk and one pair the legs of the patient, the parallel bars v being adapted, through being provided with the slots w and the thumb nuts x to rigidly clamp the said arms thereto and to securely hold them for the time being a predetermined distance apart.

It will be observed that normally the two parallel series of grapplers lie transversely to the longitudinal axis of the trunk A , thereby being adapted to lie parallel with the invalid, but that if necessary or desirable the suspended persons may be turned about so as to lie parallel with the longitudinal axis of the truck through the operation of the flexible shaft h and the swivel block r .

I operate my device as follows: Rolling the truck A to the side of the cot or bed I allow the forward end thereof to run under the said cot or bed thus bringing the lifting means directly above the invalid, and parallel therewith. I then lower the toothed bar g , and with it the grapplers i until the respective plates u may be united by being slid under the invalid by rotating the flexible shaft h , thereby drawing the four pairs

or series of oppositely arranged plates toward each other by means of the toggle levers t , one of which (the middle one) owing to its configuration and position will lock the said grapplers i securely in such position, when I am prepared to raise the invalid from the cot or bed. I then rotate the crank c by means of the hand crank q and with it the counter shaft e when the spiral disk f affixed to the said counter shaft will also be rotated, its spiral thread therein engaging the teeth of the toothed bar g when the latter will be raised, thereby lifting the invalid by means of the grapplers i and the plates u . Then should it be necessary or desirable I turn the lifting means around a quarter of the circle through the flexibility of the shaft h , thereby arranging the invalid parallel with the longitudinal axis of the truck A . Means may be provided whereby the invalid may be held permanently in such position, but I deem it necessary to hold invalids in such position only when passing through doorways or narrow halls. When it is desirable to return the invalids to their cots or beds I roll the truck back to the said cots or beds, when I reverse the direction or rotation of the counter shaft e and the spiral disk affixed thereupon, when the lifting means will be lowered and the invalid again placed upon the cot or bed, when by rotating the flexible shaft h in an opposite direction to the one used in closing in the plates u , the toggle levers will operate to open the grapplers i and to release the invalid.

I claim as my invention.

1. The combination with the truck substantially as herein shown, the lifting and supporting means embodying a horizontally arranged shaft, a spiral disk affixed thereon and revoluble therewith, a vertical toothed bar, the teeth of which engage the thread of the said spiral disk, grapplers pivotally affixed to the said toothed bar and revoluble thereon and toggle levers affixed to and adapted to operate the said grapplers, substantially as and for the purposes described.

2. In a device of the character described, the combination with the truck and crane substantially as herein shown, of the vertically arranged toothed bar mounted and longitudinally movable within the said crane, grapplers suspended from but revoluble upon said toothed bar, a horizontally arranged flexible shaft mounted and revoluble in the said crane, a crank disk rigidly affixed to and revoluble with the said flexible shaft, and toggle levers connecting the said grapplers and the said crank disk, substantially as shown, and for the purpose described.

3. In a device of the character herein shown, the combination with the truck A and the crane B substantially as shown, of a horizontally arranged crank shaft

mounted and revoluble in the said crane, a
counter shaft arranged parallel with the
said crank shaft, a sprocket wheel affixed
upon the said crank shaft, a similar sprocket
5 wheel affixed upon the said counter shaft, a
chain driven by the first named sprocket
wheel and adapted to drive the said last
named sprocket wheel, a vertically arranged
toothed bar recessed and longitudinally mov-
10 able in the said crane, a spiral gear, the
thread of which engages the teeth of the
said toothed wheel, grapplers connected to
the said toothed bar, a flexible shaft cham-

bered within the said crank shaft, a crank
disk affixed to the said flexible shaft, and 15
toggle levers connecting the said crank disk
and the said grapplers, substantially as
shown and for the purposes specified.

In testimony whereof I have hereunto set
my hand in presence of two subscribing wit- 20
nesses.

WILSON A. ALLEN.

Witnesses:

A. O. BEHEL,
S. A. MILLER.